



## Chesterfield County, Virginia

### Memorandum

**DATE:** JUNE 12, 2007

**TO:** CHESTERFIELD COUNTY PLANNING COMMISSION

**FROM:** RICHARD MCELFISH,  
DIRECTOR OF ENVIRONMENTAL ENGINEERING  
SCOTT FLANIGAN,  
WATER QUALITY MANAGER

**SUBJECT:** PROPOSED AMENDMENTS TO ORDINANCES RELATING TO WATER  
QUALITY IN THE UPPER SWIFT CREEK WATERSHED

Please find attached the proposed amendments relating to water quality in the Upper Swift Creek Watershed. An explanatory summary has also been attached for your consideration. Staff will be available at the June 19, 2007 work session to further discuss the proposed amendments.

These proposed amendments will address water quality concerns related to total phosphorus loads from future development. The proposed amendments will promote development standards that are consistent with the protection of critical natural systems within the watershed and facilitate the county's water quality goals for area streams and the Swift Creek Reservoir.

Staff is requesting the Planning Commission schedule a public hearing for July 17, 2007 to discuss the proposed changes.

C: Lane B. Ramsey, County Administrator  
M.D. "Pete" Stith, Deputy County Administrator for Community Development  
Kirkland A. Turner, Director of Planning

## **Summary of Proposed Amendment to Ordinances Relating to Water Quality in the Upper Swift Creek Watershed.**

These ordinance amendments are designed to implement the water quality recommendations of the draft Upper Swift Creek Plan amendments. The watershed consists of land in the county located upstream of the Swift Creek Reservoir Dam. For land that is included in the watershed, the proposed amendments would address the following matters:

- **Section 8-6. Erosion and sediment control plans.** The proposed amendment allows for increased erosion and sediment control measures to be used; providing additional protection to environmental features and waterbodies.

Erosion caused by stormwater is detrimental to water quality due to displaced sediment into streams. This deposition is of particular concern during construction activities. Areas under construction are characterized by increased erosion of unprotected, exposed soil during rain events. Excessive pollutant loads can be produced from construction areas if proper erosion-control practices are not implemented. Even with proper implementation of erosion-control practices, Total Suspended Solid (TSS) loads from construction sites are significantly higher than loads from stabilized areas. Erosion and sediment control practices can greatly reduce TSS exported from construction sites. To ensure the protection of water quality, when construction is near or adjacent to resource features or waterbodies, additional measures that exceed the state minimum standards will be required.

- **Section 17-76. Curb and gutter.** The proposed amendments allow for the use of roadside ditches in the place of curb and gutter along local streets in subdivisions within the watershed.

The purpose of this amendment is to reduce overall impervious surface within a development associated with road widths and curb/gutter. Furthermore; the benefits of using roadside ditches in place of curb/gutter will enable additional pollutant reduction from road surfaces. This is accomplished allowing pollutants to first be conveyed to a pervious area for treatment through infiltration and settling. Alternative design measures may be incorporated into the ditches to provide additional pollutant removal efficiency and reduction of storm flow volume. Examples of this would be increase infiltration, lengthen flow paths, slope reduction or meandering the channel.

### **Section 19-237. Upper Swift Creek Watershed.**

- **Sec. 19-238. Development regulations.** The proposed amendments reduce the post-development total phosphorus loads for future development to a level which would require no net increase over pre-development levels. This new standard recognizes the importance of protecting the watershed by ensuring that development within the watershed contributes to the maintenance of water quality.
- **Sec. 19-238. Development regulations.** The proposed amendment requires the preparation of a natural resource inventory (NRI) for development sites prior to zoning. This document will identify natural resources that may be adversely affected by construction activities during the development process. Having this information enables

the site designer, developer and county officials to make informed decisions about the development of the site and the role of these natural features in the protection of water quality. The preservation, protection, enhancement and restoration of environmentally important site features such as streams, natural swales, riparian buffers, wetlands, steep slopes, mature trees, flood plains, woodlands and highly permeable soils should be encouraged and may provide compensation via a stormwater credit system.

This information in the NRI is typically required during the development process and should not significantly increase the applicant's costs. By completing this inventory prior to the application for a rezoning request, the information in the NRI will be used at a time when it can provide the greatest benefits. Some of these benefits may include avoidance and minimization of environmental impacts, a smoother review process and the ability to present a more comprehensive project plan to public and private stakeholders at time of zoning which can maximize LID uses.

- **Sec. 19-238. Development regulations.** The proposed amendments encourage the use of low impact development (LID) site planning and practices to reduce pollutants and control stormwater runoff. As a result of the more restrictive development standard, new technology must be employed.

Conventional land-use and development practices do not adequately protect aquatic resources and habitat, nor mimic the natural hydrologic regimes. LID uses technology-based practices to ensure that a site's post-development hydrologic functions mimic those in its pre-development state. These functions include groundwater recharge, infiltration, and reduction frequency/volume of stormwater discharges to receiving streams. LID development practices and technologies focuses on identifying **project-specific** site solutions. LID takes advantage of natural resources for their functional, recreational and aesthetic qualities benefits the county, the developer, the home buyer, and the environment.

AN ORDINANCE TO AMEND THE CODE OF THE COUNTY OF CHESTERFIELD, 1997, AS AMENDED, BY AMENDING AND RE-ENACTING SECTION 8-6 OF THE EROSION AND SEDIMENT CONTROL ORDINANCE, SECTION 17-76 OF THE SUBDIVISION ORDINANCE AND SECTIONS 19-238 AND 19-301 OF THE ZONING ORDINANCE RELATING TO WATER QUALITY REQUIREMENTS IN THE UPPER SWIFT CREEK WATERSHED

BE IT ORDAINED by the Board of Supervisors of Chesterfield County:

(1) *That Sections 8-6, 17-76, 19-238 and 19-301 of the Code of the County of Chesterfield, 1997, as amended, are amended and re-enacted to read as follows:*

**Chapter 8**

**EROSION AND SEDIMENT CONTROL**

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**Sec. 8-6. Erosion and sediment control plans.**

(e) For construction sites that are adjacent to sensitive environmental features such as RPAs, wetlands and floodplains, the approved plan may incorporate additional measures required by the environmental engineer to adequately prevent sediment from entering those resources. In addition, the environmental engineer will require additional measures other than the minimum standards contained in the Virginia Erosion and Sediment Control Handbook if he determines that such measures are necessary for protection of sensitive environmental features and/or water resources within the Upper Swift Creek Watershed.

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**Chapter 17**

**SUBDIVISION OF LAND**

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**Sec. 17-76. Arrangement.**

(j) Curb and gutter shall be required on all local streets in all subdivisions, where the average lot has less than 100 feet of street frontage. In the Upper Swift Creek Watershed, roadside ditches shall be required on all local streets in all subdivisions where the average lot has 90 feet or more of street frontage. These calculations excludes those lots fronting on the radial terminus of a cul-de-sac. Curb and gutter installation may be waived, in whole or in part, by the director of planning or planning commission to preserve the existing neighborhood local street drainage method.

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## Chapter 19

### ZONING

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#### Sec. 19-238. Development regulations.

Any use, development or redevelopment of land in the Upper Swift Creek Watershed shall meet the following performance criteria:

- (a) No more land shall be disturbed than is necessary to provide for the desired use or development;
- (b) Indigenous vegetation shall be preserved to the maximum extent possible consistent with the use or development allowed;
- (c) Land development shall minimize impervious cover consistent with the use or development allowed;
- (d) (1) Stormwater runoff shall be controlled to achieve the following:
  - a. For any new use or development, the post-development, nonpoint-source pollution runoff loads of phosphorous and lead shall not exceed the following:
    - (i) Phosphorus:
      - 1. The post-development total phosphorus load for all land uses except agricultural practices residential uses located in areas identified in the Midlothian Area Community Plan for low density residential (1.01 to 2.0 units per acre), in the Route 288 Corridor Plan for Residential (1 to 2.0 dwellings per acre), and in the Upper Swift Creek Plan for single family residential: (2.0 units/acre or less), shall not exceed ~~0.22~~ 0.16 pounds per acre per year.
      - ~~2. The post-development total phosphorus load for all other uses shall not exceed 0.45 pounds per acre per year.~~
    - (ii) Lead:
      - 1. The post-development total lead load for nonresidential uses and residential uses at a density

greater than 2.0 units per acre located in areas identified for such uses in the comprehensive plan shall not exceed 0.19 pounds per acre per year.

2. The post-development total lead load for all other uses shall not exceed 0.03 pounds per acre per year.
  - b. For redevelopment sites not currently served by water quality best management practices, the existing nonpoint-source pollution runoff loads of phosphorus and lead shall be reduced by at least ten percent after redevelopment; however, the loads of such elements need not be reduced below the levels set forth in subsection (d)(1)a.
  - c. For redevelopment sites currently served by water quality best management practices, the post-development, nonpoint-source pollution runoff loads of phosphorus and lead shall not exceed the existing loads or the loads set forth in subsection (d)(1)a, whichever are greater.
- (2) Compliance with the requirements of subsection (d)(1) shall be achieved ~~on-site~~ through incorporation of best management practices including Low Impact Development practices that achieve the required control, unless the director of environmental engineering determines that one of the following storm water management options has been satisfied.
- a. Mitigation measures approved by the director of environmental engineering in conjunction with the plan approval process. Mitigation measures may include, but are not limited to, the following: (i) construction of BMP's on or off-site, (ii) retrofitting an existing BMP on or off-site, (iii) stream or buffer enhancements or restoration, (iv) purchasing of credits from owners of other property in the watershed when best management practices on the other property exceed the required control, (v) use of perpetual conservation or open space easements, and (vi) if the foregoing mitigation measures are not adequate to achieve the required control, payment to the County of cash sufficient to achieve the required control through other mitigation measures as determined by the director of environmental engineering. Mitigation measures shall be approved by the director of environmental engineering only when: (i) the proposed mitigation measures are located within the Upper Swift Creek watershed, (ii) the proposed mitigation measures are sufficient to achieve the required control, and (iii) the applicant provides an engineer's certification that there is no viable means of sufficiently achieving the required control on site. Unless otherwise determined by the director of environmental

engineering, mitigations measures shall be located in the same subwatershed of the Upper Swift Creek watershed.

- b. Property that the director of planning has determined to be vested as to the right to comply with the required control through pro rata payments for regional BMPs pursuant to Article VI of chapter 12 repealed February 14, 2007, shall achieve compliance through (i) a pro rata payment equal to what would have been required under chapter 12, which shall be used for mitigation measures in the watershed as determined by the director of environmental engineering, (ii) compliance with the other provisions of 19-238(d)(2), or (iii) a combination thereof. In any event, however, even vested properties shall utilize on-site controls necessary to achieve a total phosphorus load of 0.45 pounds per acre per year as required by the Chesapeake Bay Preservation Act regulations.
  - c. Compliance with a state or locally implemented program of stormwater discharge permits pursuant to section 402(p) of the federal Clean Water Act, as set forth in 40 CFR 122, 123, 124 and 504, dated December 7, 1988.
  - d. For a redevelopment site that is completely impervious as currently developed, restoring a minimum of 20 percent of the site to vegetated open space.
- (3) Any maintenance, alteration, use or improvement to an existing structure which does not degrade the quality of surface water discharge, as determined by the director of environmental engineering, may be exempted from the requirements of this section.
- (e) Every zoning application shall include a natural resource inventory for the proposed development site except as set forth below. The purpose of the natural resource inventory is to determine the environmental features that should be protected due to sensitivity to developmental impacts which may cause degradation of the water quality of the Upper Swift Creek Reservoir.
- (1) The following development projects are exempt from the requirement to provide a natural resource inventory:
    - a. Any disturbance less than an area of 2,500 feet;
    - b. Single family residential dwelling that is not part of a subdivision; and

c. Construction of water, sewer, natural gas, underground telecommunications and cable television lines, railroads, or public roads.

(2) The natural resource inventory shall be drawn to scale clearly delineating the following components:

a. Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow;

b. A 100-foot buffer area located adjacent to and landward of the components listed in item a. above, and along both sides of any water body with perennial flow;

c. Nontidal wetlands not included in item a. above;

d. 100-year floodplains as designated in section 19-57;

e. Slopes 25 percent or greater;

f. Hydrologic soil groups;

g. Threatened and endangered species;

h. Transaction screen;

i. Greenways;

j. Abandoned or existing mines or quarries;

k. Historical, archeological, or cultural features; and

l. Any other sensitive environmental feature specific to the site.

(3) A narrative describing the location, density, plant species and condition of the vegetation on the site shall be provided with the natural resource inventory.

(4) The natural resource inventory shall be certified as complete and accurate by a person or firm competent to make the inventory.

(f) The use of Low Impact Development site planning and practices shall be encouraged to reduce pollutants and control stormwater runoff at the source.



- (1) The design criteria, hydrologic analysis, and calculation procedures for LID practices shall be as published by the Chesterfield County, Department of Environmental Engineering.
  - (2) Storm drainage easements shall be recorded to identify locations of LID practices on lots or parcels. The property owner shall not remove or alter the function of LID practices without prior written approval from the director of environmental engineering.
- (e g) If the best management practices that are used require regular or periodic maintenance in order to continue their functions, maintenance shall be ensured by a maintenance/easement agreement, bond or other assurance satisfactory to the director of environmental engineering; and
- (f h) Land on which agricultural activities are being conducted shall have a soil and water quality conservation plan approved by the James River Soil and Water Conservation District. Such plan shall be based on the Field Office Technical Guide of the U.S. Farm Service Agency Soil Conservation Service and accomplish water quality protection consistent with this section.

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#### **Sec. 19-301. Definitions.**

For the purposes of this chapter, the following words and phrases shall have the following meanings:

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*Low Impact Development or LID:* A design strategy with the goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques to create a functionally equivalent hydrologic site design. Hydrologic functions of storage, infiltration and ground water recharge, as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale stormwater retention and detention areas, reduction of impervious surfaces, and the lengthening of runoff flow paths and flow time. Other strategies include the preservation/protection of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, valuable (mature) trees, flood plains, woodlands, and highly permeable soils.

*Transaction Screen:* A standardized approach to environmental due diligence that provides a generally acceptable degree of confidence about the environmental condition of the property. The study includes a search of governmental databases and a review of regulatory agency records describing any detailed environmental investigations which may have occurred

on the property. It also includes a questionnaire concerning the environmental history of the property and a site visit to observe site conditions on and around the property.

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- (2) *That this ordinance shall become effective immediately upon adoption.*